DETAILED ACTION

Status of the Claims

1. Claims 54-56, 61-63, 68-70, 73-74 and 77-83 are pending.

Applicants' amendment filed October 13, 2009 is acknowledged. Applicant's response has been fully considered. Claims 54, 63 and 82 have been amended. Therefore, claims 54-56, 61-63, 68-70, 73-74 and 77-83 are examined.

2. It is noted that the status of claims 69 and 77 is indicated as "Currently Amended", which is not correct since these claims are not currently amended.

Withdrawn Claim Rejections - 35 USC § 102

3. The previous rejection of claim 63, under 35 U.S.C. 102(b) as being anticipated by Hinnen *et al.* (Proc. Natl. Acad. Sci. USA 75, 1929-1933 (1978)) as evidenced by Weber *et al.* (US 2004/0235088), is withdrawn in view of applicants' amendment of the claims, and applicants' response at pages 7-8 in the amendment filed October 13, 2009.

Maintained Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 54-56, 61-63, 68-70, 73-74 and 77-83 remain rejected under 35 U.S.C. § 112, first paragraph, written description, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The instant claims are drawn to yeast strains and expression cassettes containing genes defined only by the enzyme they encode, wherein the enzyme is defined only be name, which name is indicative of a function. The instant claims are also drawn to methods of producing ergosterol or an intermediate product thereof using genes in altered form that are defined only by function.

The Court of Appeals for the Federal Circuit has recently held that a "written description of an invention involving a chemical genus, like a description of a chemical species, 'requires a precise definition, such as be structure, formula [or] chemical name,' of the claimed subject matter sufficient to distinguish it from other materials." University of California v. Eli Lilly and Co., 1997 U.S. App. LEXIS 18221, at *23, quoting Fiers v. Revel, 25 USPQ2d 1601, 1606 (Fed. Cir. 1993) (bracketed material in original). To fully describe a genus of genetic material, which is a chemical compound, applicants must (1) fully describe at least one species of the claimed genus sufficient to represent said genus whereby a skilled artisan, in view of the prior art, could predict the structure of other species encompassed by the claimed genus and (2) identify the common characteristics of the claimed molecules, e.g., structure, physical and/or chemical characteristics, functional characteristics when coupled with a known or disclosed correlation between function and structure, or a combination of these.

The instant specification describes the genes to be used in the claimed methods by virtue of function alone. No structures, other than specific species of genes (i.e., the genes in S. cerevisiae (yeast); page 2, paragraph 1) are described. No relation between the structure of the species (e.g., a gene of the HMG-Co-A-reductase) and function is described. The specification merely indicates that for HMG1 gene, "altered" means that of the corresponding gene, only the

catalytic area is expressed without the membrane-bound domains (See EP-0486290; page 9, first full paragraph). However, there is no description regarding a gene of the HMG-Co-A-reductase (t-HMG), a gene of the squalene synthetase (ERG9), a gene of the acyl-CoA;sterol-acyltransferase (SAT1) and a gene of squalene epoxidase (ERG1), which are recited in the claims. Thus, one of skill in the art would be required to predict new genes for use in the claimed methods based solely on their function, or the function of their encoded proteins. Such methods would not be predictably considering the minimal structural information provided in the specification. The lack of description on structure and function relationship for the genes (i.e., a gene of the HMG-Co-A-reductase (t-HMG), a gene of the squalene synthetase (ERG9), a gene of the acyl-CoA;sterol-acyltransferase (SAT1) and a gene of squalene epoxidase (ERG1)) encoding the enzymes, and lack of representative species as encompassed by the claims, applicants have failed to sufficiently describe the claimed invention, in such full, clear, concise terms that a skilled artisan would not recognize applicants were in possession of the claimed invention.

Response to Arguments

Applicants indicate in the present amended claims, the phrase "altered" refers only to the t-HMG gene, which is a variant of the HNG1 gene without the membrane-bound domain (See for example, EP 486290). Thus, with regards to the t-HMG gene, the disclosure provided in the specification provides adequate guidance on the structural features (i.e., polynucleotide sequence) of such an altered gene and organizations thereof in altered form. As for the nucleotide sequence of the ERG9, ERG1 and SAT1, ADH1 yeast genes and/or the promoter sequences associated therewith, it is now well-settled that a specification need not disclose, and preferably omits, what is well known to those skilled in the art when an application is filed.

However, the skilled worker could easily refer to the articles discussed and cited on page 2-3 and 28-29 of the specification. The articles disclose structural and/or functional aspects of the genes recited in the claims. Thus, a skilled artisan can readily determine both the nature (i.e., mutant or wild-type) as well as the structure (i.e., amino acid sequence) of the proteins encoded by the genes. A cursory review of the aforementioned disclosures is all that is needed. Thus, it is believed that the amendment to the claims and the comments renders the rejection moot (page 7 of the response).

Applicants' response has been fully considered, however, the arguments are not found persuasive because of the following reasons. While the genes of *S. cerevisiae* (yeast) were known in the art (see also page 2, ¶1 and references on pages 28-29 of the specification) prior to the filing date of the instant application, the claims, which are directed to suitable genes (either *S. cerevisiae*, yeast or other microorganisms; e.g., a gene of the HMG-Co-A-reductase (t-HMG), a gene of the squalene synthetase (ERG9), a gene of the acyl-CoA;sterol-acyltransferase (SAT1) and a gene of squalene epoxidase (ERG1)), encompass any altered or unaltered genes of t-HMG, ERG9, ERG1 and SAT1 from various species of yeast or other microorganisms. Although the specification and the art describe the wild-type genes of t-HMG, ERG9, ERG1 and SAT1 of *S. cerevisiae,* a specific altered t-HMG gene, and ADH1 promoter, neither the specification nor the art discloses various altered or unaltered genes of t-HMG, ERG9, ERG1 and SAT1 from different species of yeast or other microorganisms that encode the enzyme. Since there is no structure/function correlation for genes of t-HMG, ERG9, ERG1 and SAT1 (either altered or unaltered) from different species of yeast or other microorganisms, one of skill in the art could not predict the sequences of genes for use in the claimed methods based solely on their function,

or the function of their encoded proteins. Thus, applicants have failed to sufficiently describe the claimed invention, and the rejection is maintained.

Conclusions

5. No claims are allowed.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Min Kam whose telephone number is (571) 272-0948. The examiner can normally be reached on 8.00-4:30, Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Manjunath Rao can be reached at 571-272-0939. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Chih-Min Kam/
Primary Examiner, Art Unit 1656

CMK
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